3.4/4.4 – Solving Problems Using Triangles (Concept#24)

Problems involving Speed,Time and Distance

Note: Sometimes you will not be given the distance travelled but instead the speed and the time travelled.

Distance = Speed × Time

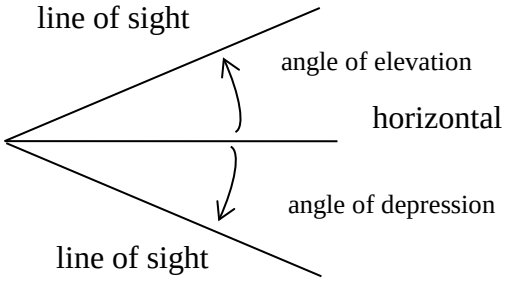
Examples:

1. Two cars leave a town at the same time going in different directions. One car is travelling at 85 km/h and the other is travelling at 95 km/h . After 3.5 hours the cars are found to be 450 km apart. What is the angle between the two routes that the cars are travelling? (Answer angle = 90.996^0)

Problems involving Angles of Elevation and Depression

Angles of Elevation or Depression:

Triangles can be used to solve many real life problems. As we have previously seen, one common application is using the angle of elevation (inclination) or depression to find distances.



The angle of elevation/depression is always **<u>referenced to the horizontal.</u>

2. A hot-air balloon is flying above BC Place Stadium. Marie is standing due north of the stadium and can see the balloon at an angle of elevation of 64º. Roy is due south of the stadium and can see the balloon at an angle of elevation of 49º. The horizontal distance between Maria and Roy is 500 m. Determine the distance, to the nearest tenth, that the hot-air balloon is from Marie. (Answer= 409.9m)

3. A telephone pole of length 8 m is located on the side of a hill that is inclined at an angle of 21° with the horizontal. The pole is supported by a wire of length 12 m that is attached to a stake in the ground that is directly uphill from the pole so that the pole remains vertical. What is the angle between the wire and the hill? Give your answer to two decimal places. (Answer= 38.491^0)

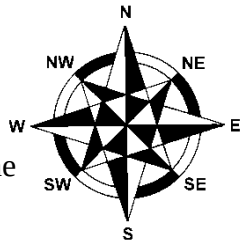
Sometimes, you have to break the problem into two parts:

4. The Delta Regina Hotel is the tallest building in Saskatchewan. From the window of her room on the top floor at a height of 70 m, Suzie observes a car moving toward the hotel. If the angle of depression changes from 18º to 35º during the time that Suzie observes the car, determine the distance that the car has travelled. Answer to the nearest tenth. (answer= 115.467m)

Problems involving Directions

Using Directions:

The compass is a circle divided into points and position and each of which is given a name.



Directions can also be given using a ***positive acute angle*** formed by the line of travel with the ***north-south line***.

Note: Directions always use a vertical line as the initial side!

Example:

5. Max decided to ski to a friend's cabin. He skied 6.8 km in the direction N35°E. He rested, then skied S30°E and arrived at the cabin. The cabin is 10.2 km from his home, as the crow flies. Determine, to the nearest tenth, the distance he travelled on the second leg of his trip.(Answer= 11.0km)

6. Two ships leave the same harbour at the same time, one at a speed of 12 km/h on a course of N20ºE and the other at a speed of 15 km/h on a course of S74ºW. How far will the ships be after 4 hours? Give your answer to two decimal places.(answer =96.38km)